

Chemical Analysis Report

SE-DIST-2023-07-21-02

Florida DEP Laboratory
2600 Blair Stone Road
Tallahassee, FL 32399-2400
DOH Accreditation E31780

Event Description: **Algal Bloom Response - SE ROC**
Request ID: **RQ-2023-07-10-63**
Customer: **SE-DIST**
Project ID: **BLOOM-RESP**

Send Reports to:
FL Dept. of Environmental Protection
FL Dept. of Environmental Protection
2199 South Rock Road
Fort Pierce, FL 34945
Attn: Andrew Luering

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Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 01-AUG-2023 08:46

A handwritten signature in black ink that reads "Kerry Tate". The signature is written in a cursive, flowing style with a horizontal line extending from the end of the name.

Case Narrative

Unless otherwise noted, all samples included in this report were received in accordance with protocols referenced in Chapter 62-160, Florida Administrative Code (F.A.C.). Results published in this report pertain only to the samples as submitted to, and received by the laboratory. All times in this report are adjusted to the applicable Eastern Time Zone (EST or EDT).

Results for the following analytical groups are included in this report: Nutrients and Pesticides.

Scientific notation may be used in reporting very large or small values. Values reported using scientific notation will take the form of the following example: 1.3E+03, which is equivalent to 1.3×10^3 or 1300.

Unless otherwise noted, analytical values for soil and sediment samples are reported on a dry weight basis, and analytical values for waste and tissue samples are reported on a wet weight basis.

Results for TNI accredited tests met requirements established by The NELAC Institute. A double asterisk (**) is used to indicate an analyte/matrix/method for which the laboratory is not TNI accredited by the Florida Department of Health Environmental Laboratory Certification Program or where accreditation for that field of testing is not applicable.

Any significant anomalies or deviations from established protocols are documented in Non-Conformance Reports, which, where appropriate, are included within this analytical report. Additional comments related to specific analytical tests may be included as remarks following the analytical results for each sample. Such comments and remarks are for informational purposes only and are not intended to convey judgement about the usability of the reported data.

A quality control report on the performance of the test method for the submitted samples is included. Uncertainty associated with the analytical results contained in this report can be estimated from the reported quality assurance results and from published quality control acceptance limits for each analytical test. Matrix quality control results (matrix spike recoveries and matrix sample precision) pertain only to the matrix sample tested and do not necessarily reflect test method performance for other samples.

Typical matrix quality control (QC) measurements may include matrix spike recovery, matrix spike duplicate recovery, matrix spike precision and matrix sample precision. Not all matrix QC results may be available or reportable; where they are not an explanation is provided. Typical reasons for unavailable QC results include, but are not limited to, a) insufficient matrix sample to perform some or all QC measurements; b) analyte concentration in the sample replicated was too low for a meaningful measurement of precision and c) analyte concentration in the matrix sample spiked was too high (relative to the amount of analyte spiked) for a meaningful measurement of recovery. Where matrix QC results are unavailable, other method performance metrics (e.g., LCS recovery, LCS precision, surrogate recovery) may be used to assess performance of the method. Comments explaining any missing QC measurements are not intended to convey any adverse conclusions about the quality of the reported data.

Precision is reported as relative percent difference unless otherwise noted.

Quality Control codes as defined below may be used in this report to indicate results that are associated with one or more quality control elements which did not fall within established test method criteria. Such results may be qualified as estimates using a J qualifier as required by 62-160 F.A.C. Explanations are included in the report for any results that were reported as estimates for other reasons.

QC Codes used in this report may include:

- LCS – Recovery for the batch Laboratory Control Sample (LCS) was outside existing control limits;
- MS – Recovery for the batch matrix spike (MS) was outside existing control limits;
- CCV – Recovery for a continuing calibration verification (CCV) standard was outside existing control limits;
- SUR – Recovery of a surrogate (SUR) for associated analytes was outside existing control limits;
- RPD – The precision, measured as relative percent difference (RPD), of batch replicate measurements was outside existing control limits;
- RSD – The precision, measured as relative standard deviation (RSD), of batch replicate measurements was outside existing control limits;
- SMP – Sample - used precision derived from replicate analyses of a sample;

The following data qualifiers are used, where applicable, in this report as specified in 62-160 F.A.C.

- A - Value reported is the mean of two or more determinations.
- B - Results based on colony counts outside the acceptable range.
- I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
- J - Estimated value and/or the analysis did not meet established quality control criteria.
- K - Actual value is known to be less than value given.
- L - Actual value is known to be greater than value given.
- N - Presumptive evidence of presence of material.
- O - Sampled, but analysis lost or not performed.
- Q - Sample held beyond normal holding time.
- T - Value reported is less than the criterion of detection.
- U - Material was analyzed for but not detected. The reported value is the method detection limit for the sample analyzed.
- V - Analyte was detected in both sample and method blank.
- X - Too few individuals to calculate SCI value.
- Y - The laboratory analysis was from an unpreserved or improperly preserved sample. The data may not be accurate.
- Z - Colonies were too numerous to count (TNTC).

Quality control information from overflow laboratories may not be included in this report. Please refer to the associated report from the overflow laboratory for additional information.

Sample Location: Plantation Isles Canal SW 56th Avenue

Collection Date/Time: 07/20/2023 12:35

Field ID: SEHAB0096

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2425881	DEP SOP: NU-094-1	Color (true)	38		PCU	P432873	
2425882	EPA 350.1 Rev. 2.0	Ammonia-N	0.027		mg N/L	P433175	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.3		mg N/L	P433030	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.098		mg N/L	P432991	
	EPA 365.1 Rev. 2.0	Total-P	0.065		mg P/L	P432960	
2425883	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P432867	
2425884	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P432879	
		Cylindrospermopsin	0.10	U	ug/L	P432795	
		Desmethyl microcystin LR	0.25	U	ug/L	P432795	
		Microcystin HilR	0.25	U	ug/L	P432795	
		Microcystin HtyR	0.25	U	ug/L	P432795	
		Microcystin LA	0.10	U	ug/L	P432795	
		Microcystin LF	0.10	U	ug/L	P432795	
		Microcystin LR	0.25	U	ug/L	P432795	
		Microcystin LW	0.25	U	ug/L	P432795	
		Microcystin LY	0.10	U	ug/L	P432795	
		Microcystin RR	0.10	U	ug/L	P432795	
		Microcystin WR	0.50	U	ug/L	P432795	
		Neosaxitoxin	0.50	U	ug/L	P432879	
		Microcystin YR	0.25	U	ug/L	P432795	
		Saxitoxin	0.50	U	ug/L	P432879	
		Nodularin-R	0.10	U	ug/L	P432795	

Quality Assurance Report Method Blank Results

Reference Method: DEP SOP: NU-094-1
Batch ID: P432873

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P433175

Component	Result	Code	Units
Ammonia-N	0.002	U	mg N/L

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P433030

Component	Result	Code	Units
Kjeldahl Nitrogen	0.080	U	mg N/L

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P432991

Component	Result	Code	Units
NO2NO3-N	0.004	U	mg N/L

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P432960

Component	Result	Code	Units
Total-P	0.002	U	mg P/L

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P432867

Component	Result	Code	Units
O-Phosphate-P	0.004	U	mg P/L

Reference Method: EPA 8321B
Batch ID: P432795

Component	Result	Code	Units
Cylindrospermopsin	0.10	U	ug/L
Desmethyl microcystin LR	0.25	U	ug/L
Microcystin H1LR	0.25	U	ug/L
Microcystin HtyR	0.25	U	ug/L
Microcystin LA	0.10	U	ug/L
Microcystin LF	0.10	U	ug/L
Microcystin LR	0.25	U	ug/L
Microcystin LW	0.25	U	ug/L
Microcystin LY	0.10	U	ug/L
Microcystin RR	0.10	U	ug/L
Microcystin WR	0.50	U	ug/L
Microcystin YR	0.25	U	ug/L
Nodularin-R	0.10	U	ug/L

Quality Assurance Report

Method Blank Results

Reference Method: EPA 8321B
Batch ID: P432879

Component	Result	Code	Units
Anatoxin-a	0.25	U	ug/L
Neosaxitoxin	0.50	U	ug/L
Saxitoxin	0.50	U	ug/L

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: DEP SOP: NU-094-1
Batch ID: P432873

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	99.1		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P433175

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	98.2		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P433030

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	108		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P432991

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	100		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P432960

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	97.8		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P432867

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	99.8		P	90 - 110

Reference Method: EPA 8321B
Batch ID: P432795

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	88.1		P	40 - 160
Desmethyl microcystin LR	97.4		P	40 - 160
Microcystin HILR	102		P	40 - 160
Microcystin HtyR	90.7		P	40 - 160
Microcystin LA	102		P	40 - 160
Microcystin LF	91.9		P	40 - 160
Microcystin LR	110		P	40 - 160
Microcystin LW	85.9		P	40 - 160
Microcystin LY	114		P	40 - 160
Microcystin RR	89.0		P	40 - 160
Microcystin WR	85.9		P	40 - 160
Microcystin YR	114		P	40 - 160
Nodularin-R	93.2		P	40 - 160

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 8321B
Batch ID: P432879

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	112		P	40 - 150
Neosaxitoxin	95.0		P	40 - 150
Saxitoxin	82.4		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P433175

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2425873	Ammonia-N	96.8	98.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P433030

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2425873	Kjeldahl Nitrogen	103	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P432991

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2425825	NO2NO3-N	97.0	97.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P432960

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2425935	Total-P	100	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Batch ID: P432867

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2425874	O-Phosphate-P	98.9	99.9	P/P	90 - 110

Reference Method: EPA 8321B

Batch ID: P432795

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2425748	Cylindrospermopsin	81.7	97.3	P/P	40 - 160
2425748	Desmethyl microcystin LR	94.6	113	P/P	40 - 160
2425748	Microcystin HiLR	98.6	115	P/P	40 - 160
2425748	Microcystin HtyR	88.8	101	P/P	40 - 160
2425748	Microcystin LA	98.4	112	P/P	40 - 160
2425748	Microcystin LF	99.5	117	P/P	40 - 160
2425748	Microcystin LR	108	126	P/P	40 - 160
2425748	Microcystin LW	82.9	94.5	P/P	40 - 160
2425748	Microcystin LY	114	126	P/P	40 - 160
2425748	Microcystin RR	87.0	102	P/P	40 - 160
2425748	Microcystin WR	77.6	94.8	P/P	40 - 160
2425748	Microcystin YR	116	128	P/P	40 - 160
2425748	Nodularin-R	89.1	107	P/P	40 - 160

Reference Method: EPA 8321B

Batch ID: P432879

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2425748	Anatoxin-a	109	118	P/P	40 - 150
2425748	Neosaxitoxin	86.2	92.9	P/P	40 - 150
2425748	Saxitoxin	75.0	81.3	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P432873

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2425813	Color (true)	2.31	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P433175

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2425873	Ammonia-N	1.09	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P433030

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2425873	Kjeldahl Nitrogen	0.752	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P432991

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2425825	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P432960

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2425935	Total-P	0.0476	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P432867

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2425874	O-Phosphate-P	1.01	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P432795

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2425748	Cylindrospermopsin	17.4	Spike	P	0 - 30
2425748	Desmethyl microcystin LR	17.3	Spike	P	0 - 30
2425748	Microcystin HtIR	15.0	Spike	P	0 - 30
2425748	Microcystin HtyR	13.3	Spike	P	0 - 30
2425748	Microcystin LA	12.5	Spike	P	0 - 30
2425748	Microcystin LF	16.5	Spike	P	0 - 30
2425748	Microcystin LR	15.3	Spike	P	0 - 30
2425748	Microcystin LW	13.1	Spike	P	0 - 30
2425748	Microcystin LY	9.25	Spike	P	0 - 30

Quality Assurance Report Precision

Reference Method: EPA 8321B
Batch ID: P432795

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2425748	Microcystin RR	16.4	Spike	P	0 - 30
2425748	Microcystin WR	20.0	Spike	P	0 - 30
2425748	Microcystin YR	9.59	Spike	P	0 - 30
2425748	Nodularin-R	17.9	Spike	P	0 - 30

Reference Method: EPA 8321B
Batch ID: P432879

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2425748	Anatoxin-a	7.65	Spike	P	0 - 30
2425748	Neosaxitoxin	7.44	Spike	P	0 - 30
2425748	Saxitoxin	8.02	Spike	P	0 - 30

* Sample, spike and/or laboratory control sample precision (LCS) is reported.

Quality Assurance Report Surrogates

Lab Sample ID: 2425884
Field Sample ID: SEHAB0096

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Anatoxin-a 13C4	99.0	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	94.7	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A120560

Included Lab Sample IDs: 2425883

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	97.9	P/P	90 - 110

Reference Method: DEP SOP: NU-094-1

Run ID: A120563

Included Lab Sample IDs: 2425881

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	98.2	99.3	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A120565

Included Lab Sample IDs: 2425884

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	106	102	P/P	50 - 160
Neosaxitoxin	84.9	83.4	P/P	50 - 160
Saxitoxin	80.3	78.4	P/P	50 - 160

Reference Method: EPA 8321B

Run ID: A120566

Included Lab Sample IDs: 2425884

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	98.5	100	P/P	60 - 160
Desmethyl microcystin LR	111	109	P/P	50 - 160
Microcystin HILR	116	116	P/P	60 - 160
Microcystin HtyR	105	103	P/P	60 - 160
Microcystin LA	122	119	P/P	50 - 160
Microcystin LF	101	106	P/P	60 - 160
Microcystin LR	122	122	P/P	60 - 160
Microcystin LW	101	101	P/P	60 - 160
Microcystin LY	133	133	P/P	60 - 160
Microcystin RR	104	103	P/P	60 - 160
Microcystin WR	105	100	P/P	60 - 160
Microcystin YR	132	129	P/P	60 - 160
Nodularin-R	106	106	P/P	60 - 160

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A120621

Included Lab Sample IDs: 2425882

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A120647

Included Lab Sample IDs: 2425882

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	102	101	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A120687

Included Lab Sample IDs: 2425882

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	100	95.9	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A120706

Included Lab Sample IDs: 2425882

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	102	99.3	P/P	90 - 110

* Pass/Fail determinations are made for each bracketing calibration verification check.

Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.

Where they are different, both control limits are provided.

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		Precision	
					LCS	MS
DEP SOP: NU-094-1	Color (true)	99.1			2.31	
EPA 350.1 Rev. 2.0	Ammonia-N	98.2	96.8	98.0		1.09
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	108	103	102		0.752
EPA 353.2 Rev. 2.0	NO2NO3-N	100	97.0	97.0		0.0
EPA 365.1 Rev. 2.0	Total-P	97.8	100	100		0.0476
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.8	98.9	99.9		1.01
EPA 8321B	Anatoxin-a	112	109	118		7.65
	Cylindrospermopsin	88.1	81.7	97.3		17.4
	Desmethyl microcystin LR	97.4	94.6	113		17.3
	Microcystin HILR	102	98.6	115		15.0
	Microcystin HtyR	90.7	88.8	101		13.3
	Microcystin LA	102	98.4	112		12.5
	Microcystin LF	91.9	99.5	117		16.5
	Microcystin LR	110	108	126		15.3
	Microcystin LW	85.9	82.9	94.5		13.1
	Microcystin LY	114	114	126		9.25
	Microcystin RR	89.0	87.0	102		16.4
	Microcystin WR	85.9	77.6	94.8		20.0
	Microcystin YR	114	116	128		9.59
	Neosaxitoxin	95.0	86.2	92.9		7.44
	Nodularin-R	93.2	89.1	107		17.9
	Saxitoxin	82.4	75.0	81.3		8.02

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2425881
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2425882
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2425882
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2425882
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2425882
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2425883
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2425884
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2425884

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
DEP SOP: NU-094-1	07/21/2023			07/21/2023 14:33	Anna M. Plaviak	2425881
EPA 350.1 Rev. 2.0	07/21/2023			07/28/2023 11:35	Ping Hua	2425882
EPA 351.2 Rev. 2.0	07/21/2023	07/26/2023 10:21	Dana G. Hughes	07/27/2023 14:24	Samantha L Bates	2425882
EPA 353.2 Rev. 2.0	07/21/2023			07/25/2023 13:22	Anna M. Plaviak	2425882
EPA 365.1 Rev. 2.0	07/21/2023	07/25/2023 14:03	Alexis Price	07/26/2023 11:15	Simonne.V. Calhoun	2425882
EPA 365.1 Rev. 2.0 dissolved	07/21/2023			07/21/2023 14:22	Elise M. Gillis	2425883
EPA 8321B	07/21/2023	07/21/2023 14:00	Tae K Lee	07/21/2023 18:40	Hana Lee	2425884
	07/21/2023	07/21/2023 14:00	Tae K Lee	07/22/2023 02:14	Juyoung Kim	2425884